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Fall Meeting
Scotian Shelf Subcommittee
10-13 September 1996

Regional Advisory Process (RAP)
of the Maritimes Region

M. Sinclair, Chairman
Hayes Boardroom, Fish Lab
Bedford Institute of Oceanography
Dartmouth, Nova Scotia
Canada B2Y 4A2

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Abstract

These proceedings record the discussions held during the fall 1996 Regional Advisory Process (RAP) meeting held at the Bedford Institute of Oceanography (BIO) during 10-13 September 1996. It outlines the main points of discussion, problem areas in the analyses and recommendations for further work. Stock status reports for the species considered were produced and subsequently submitted to the Department of Fisheries and Oceans (DFO) in Ottawa for approval.

Résumé

Le présent document rend compte des discussions ayant eu lieu durant les réunions tenues à l'Institut océanographique de Bedford (IOB) du 10 au 13 septembre 1996, dans le cadre du Processus de consultation régional du printemps. Il fait état des grands sujets débattus, des problèmes survenus dans les analyses et de recommandations pour les travaux futurs. Des rapports sur l'état des stocks des espèces considérées ont été produits et ultérieurement soumis à l'approbation des instances du ministère des Pêches et des Océans (MPO) à Ottawa.

Introduction

The meeting was opened by the Chair, Mike Sinclair, who welcomed the participants. It was noted that the industry representatives from some distance from BIO were on time, whereas several scientists living in the local area were late! The agenda was reviewed and a new item added, projections for variable time periods (S. Gavaris). The final agenda and the list of participants are shown in appendices 1 and 2. The documents that were available during the meeting are listed in Appendix 3. The minutes of two meetings of the Marine Fish Division (MFD) at BIO working group on minor species are included in Appendix 4.

Environmental Overview

Fred Page presented the temperature distributions observed during the July 1996 groundfish research vessel survey. Although 1996 bottom temperatures in 4VW and eastern 4X have been relatively cold during 1996, the amount of water below 0°C is receding from the peak in 1992. There was a long discussion involving industry representatives on their observations during the summer of 1996. Although the observations by area and depth are complex there was general consistency between industry experience and the survey results. The major focus of the presentation addressed whether bottom temperatures observed during the summer survey need to be taken into account when interpreting the trends in abundance of diverse species in the following assessments. It was concluded that the timing of the survey was such that there should be few problems when considering temporal trends in relative abundance.

4X Cod

Don Clark presented his working paper. Clarification was requested on the causes of the recent decline in landings relative to Total Allowable Catches (TACs). The recent declines in landings are a reflection of the lower TACs. Prior to 1990 the landings were not effectively controlled by quota management. There was a discussion of the relative accuracy of landings before and since 1990. Industry members felt that accuracy has improved since introduction of mandatory weigh-outs. There was also considerable discussion on the justification for the exclusion of the estimates of catch-at-age data from 1958 to 1980. It was indicated that due to concerns with the quality of the catch matrix from the earlier years, this matter had been referred to SSSC by RAP 1994. The use of a truncated catch matrix (i.e. 1980 to 1995) was consistent with the recommendations of that subcommittee. Nevertheless, there was some concern that excluding the earlier estimates the historical perspective of stock trends was not available. SSSC had also recommended that the data should be re-examined to evaluate whether 4X should be divided into two geographic areas. Most of the samples for the earlier years came from eastern 4X.

- It was *recommended* that in future years that the landings and catch matrix for the earlier years be included in the documentation (i.e. 1958 to 1979), but not necessarily used in the estimation of stock abundance.

To provide some earlier information it was requested that the research vessel survey results from 1970 to 1979 to added to the working paper analyses.

There was a discussion of the groundfish research vessel survey time series. From 1982 to the present the *Alfred Needler* has been used. Two other vessels were used between 1970 and 1981. Even though there is uncertainty surrounding the conversion factors that are in use to generate the time series, the overall series was to be included in the documentation. During the 1996 survey there had been problems with the timing of several sets. The estimates of abundance in 1996 differed considerably depending upon whether the late sets were included or not. It was decided to use two estimates of abundances for 1996; one including only sets from the standard survey (N246), including the six sets for which computer records (i.e. length frequencies) had been lost. The second estimate included the above as well as an additional four sets that were re-sampled after the cruise during N247. The first estimate, however, was considered to be more reliable. The second estimate, which was higher, was to be included in the analyses to evaluate the impact of the different survey estimates on the population estimates.

There was some discussion on whether the Individual Transferable Quota (ITQ) survey results agreed with those of the *Alfred Needler*. The ITQ catch-per-tow estimates were fairly similar between 1995 and 1996, whereas both estimates from the 1995 *Alfred Needler* survey were considerably higher than that for 1995. Also there were some differences between the length frequencies. The 1995/96 differences between the two surveys reinforced the conclusion to use the lower 1996 survey estimate in the model to generate population abundance.

The ADAPT run was discussed in some detail and a "correlated error analysis" was requested to test for the retropsective problem. The analysis indicated that there should not be a retrospective problem with the ADAPT run from 1982 to 1996.

There was a discussion on whether discarding of small cod had been an issue during 1996. Small fish closures for cod were not much of an issue in 1996.

- It was *recommended* that in the 1997 assessment that an analysis of small fish closures be included.

4VWX and 5Zc Pollock

John Neilson presented his working paper.

Landings and Fishery Information

The inability of most fleet components to land their allocations was noted and discussed. It was noted that industry claimed that such shortfalls reflected market and fishing strategies, not a lack of abundance.

Catch at Age

The agreement of new age readers with the previous age reader for the 4X samples was noted, but participants expressed concern that comparatively poor results were obtained for samples obtained from 4V, where fish were comparatively slow growing and otoliths hard to interpret. Neilson responded that the contribution of 4V to total landings was comparatively small, and the imprecision of the ageing results was not considered a major concern.

Abundance Indices

There was some discussion of the utility of the research vessel survey results. Participants agreed that survey results were highly variable with strong year effects. However, the series also appears to reflect the vessel change in the early 1980s, with the average catch rates being higher during the *Alfred Needler* years compared with the *A.T. Cameron* years.

- It was *recommended* that John Neilson examine nearshore strata for the occurrence of small pollock and to determine if survey information could be used to provide some indications of recruitment.

The assessment contained advances in the commercial catch rate analyses. Previous assessments had relied exclusively on the use of tonnage class (TC) 5 catch rate series from IOP, a concern because this fleet component accounts for a much smaller fraction of landings than before. The present assessment employs a catch rate index based on information from TC 1-3 draggers contained in ZIFF. Participants noted that the two series showed some concurrence, but agreed that the 1989 value for the new series was anomalous and probably represented unusual fishing practices during the period when cod, haddock, and pollock TACs were combined. Participants noted that conventions for the definition of subtrip had changed over time in the ZIFF data base and the implications for the calculation of catch rates need further evaluation before the series can be included in the assessment. However, the development of the alternative index was welcomed and further work to refine it was encouraged.

- It was *recommended* that John Neilson document changes in subtrip definition and determine how it might impact calculation of commercial fishery catch rates. Once this is completed, combination of the existing catch rates in a multiplicative approach could be evaluated for the next assessment.

Participants in the review were concerned with the absence of alternative indices of abundance, and enquired if other indices were possible. John Neilson recounted experiences of other countries with pollock assessments and noted that general purpose groundfish surveys do not seem to yield useful information for pollock. Norway is conducting acoustic surveys for pollock, and Iceland has initiated a gillnet survey. Among a variety of approaches recently reviewed in the ICES forum, these approahces appear to hold the best promise. Building upon this knowledge, Canada has initiated similar programs for its pollock resource. Participants noted this, and recommended continued efforts to develop alternative indices of abundance.

- It was *recommended* that John Neilson and Don Clark evaluate results of pilot acoustic survey for pollock and continue to work with gillnet fishermen around southwest Nova Scotia to obtain an index of abundance.

Assessment Results

There was considerable discussion of the assessment results compared with last year, with participants noting that the current assessment produced a considerably more optimistic view of resource status than that presented last year. During the course of the week, John Neilson and others explored reasons for the differences and presented them to the review body. In sum, the differences are attributable to differences in model formulation (improved estimates at younger ages and deletion of the oldest age estimated), revisions to the catch-at-age, and the addition of an extra year of data. Participants noted that if the newly developed TC 1-3 catch rate series was included in the model, an even more optimistic view of the resource would be obtained.

There was a request for a retrospective analyses to be completed, which was done during the week of the meetings. Participants agreed that there was general consistency of estimates of year-class abundance as additional data were added. However, for the most abundant year-class (1989) in the analysis, there was a tendency for more recent estimates to provide a more conservative interpretation of year-class strength.

Outlook

Participants noted considerable uncertainty with the understanding of stock structure and requested that the SSR reflect such concerns in the 'Outlook' section. The revised SSR indicated that sources of uncertainty included the large management unit, small catch weight accounted for in the catch rate index, and the schooling semi-pelagic nature of resource which makes traditional approaches to groundfish stock assessment difficult. Given such concerns, meeting participants recommended that the uncertainty

plot which shows the probability of exceeding target mortality rate or resulting in a biomass decline not be included in the SSR.

4VWX and 5Zc White Hake

Bob O'Boyle chaired the meeting while Mike Sinclair presented the working paper. It was indicated that the estimates of landings used in the 1995 SSR were incorrect and that this information had been used to provide advice on the reduction in landings for 1996 by FRCC. There was a discussion of the management units for white hake off Atlantic Canada. The present management units split some of the natural distributional areas that may reflect self-sustaining stocks.

- It was *recommended* that prior to the next assessment of white hake a review of management units be undertaken including industry and fisheries management. The SSIP data set needs to be fully analysed in support of the management unit discussions.

There was concern that the catch rate information, given the variable portion of the landings that had been used for CPUE, was difficult to interpret. Industry supported the view that catch rates had been declining and that there are proportionately less older/larger fish within the landings. The research vessel survey data was analysed in a variety of ways in order to determine whether different geographic areas were responding to fishing effort in a different manner.

- It was *recommended* that in the next assessment that the results of the USA spring and autumn surveys be included.

Bob Mohn presented a length frequency catch curve analysis in order to estimate differences in Z values between areas and times.

- It was *recommended* that in the next assessment growth parameters by each area be estimated and that better coverage of length frequencies of the landings be done.

There was a discussion of the importance of including information on fecundity and population egg production in the assessments. For white hake the only fecundity at length information is from the Gulf of St. Lawrence.

- It was *recommended* that fecundity information be collected for white hake in the different distributional areas.

4VsW Skate

Jim Simon presented the results of the analysis by the Elasmobranch Working Group. It was noted by the group that the initial analysis of skates was on all skate species. As information on this new fishery became available it was increasingly evident that the emphasis of the analysis should be on winter skate alone and that thorny skate was primarily a by-catch species.

The Fishery

The very high reported landings by foreign fleets prior to 1977 were considered suspect. This problem was common to many fisheries and may not reflect abundance trends. Further, the non-breakdown of skate landings by species made the interpretation of the data difficult.

- It was *recommended* that industry identify skates by species in their landings.

The selective removal of only large individuals and the localized nature of the fishery was noted with concern. There was a feeling that a reduction in catch rates by the fleet would signal the local depletion of skate and the fact that one vessel had begun fishing in another locale was of possible concern. The fleet indicated that catch rates were not declining but

- It was *recommended* that monthly catch rates be calculated to substantiate these claims.

Commercial sampling of the catch indicated that only skates greater than 60 cm were being landed and that greater than 90 % of the catch was winter skate. No reduction in length range was evident in the samples.

Resource Status

The numbers at length and minimum trawlable biomass trends for all lengths of winter and thorny skates from the summer research vessel surveys were reviewed. The biomass trends from the spring survey were not available. Based on these discussions the minimum fishable trawlable biomass for winter skate > 60 cm. was to be calculated. The interquartile ranges from the numbers at length for winter and thorny skate were presented but were difficult to follow.

- It was *recommended* that the yearly length frequencies be presented as per the haddock assessments so that year-classes can be followed through the fishery.

Industry/Science Survey

The results of the 1995 and 1996 surveys were quickly reviewed, with the focus of the discussion on the problems related to the yearly changes in gear and what was the product expected by industry from the surveys. The rockhopper configuration used in the April 1996 survey would be the guideline for all future surveys. Eventually minimum fishable biomass estimates should be able to be calculated from the industry surveys for comparison with the summer RV survey.

Biology

The results from the maturity and aging data on winter and thorny skate were presented. It was felt that without corroboration by other observers that this data be considered preliminary.

- It was *recommended* maturity information be collected throughout the year by observers and port technicians and that the aging data be corroborated.

Conversion Rates

A short history of the conversion rates used by the fishery and Sciences' role in the adjustment of this rate in 1994 to its present values was given. The changes in processing techniques by industry and the improvements in yield were noted.

- It was *recommended* that the changes that have occurred in the conversion rates be documented and that independent estimates of the present yields of product (wings) to round weight be investigated.

Outlook

The initial SSR by the Elasmobranch team was withdrawn and rewritten to enhance the concerns expressed by the group. Minimum fishable trawlable biomass estimates for the spring and summer research vessel surveys were calculated for winter skate alone. These estimates gave a range of TACs between 300 and 756t using the same criteria as were used in previous assessments of skates. This range would have resulted in the economic closure of the fishery. Due to the uncertainty of the biomass estimates, the lack of signals in the fishery of collapse and the conservation minded approach by industry it was felt that the experimental fishery could proceed for another year, but with caution.

4VWX and 5Zc Monkfish

Diane Beanlands presented the results of the Monkfish Working Group. It was explained that the area of review for this stock had been extended to include the 5Zc

portion of the Scotian Shelf due to the continuous distribution of this species across the shelf into Georges Bank, and because of the substantial percentage of landings from this area.

The Fishery

Discussion ensued over the by-catch nature of the fishery. Concern was expressed by science that since there was no real biological basis for the 20% by-catch restriction, an increase in the exploitation of other groundfish could result in higher landings of monkfish. Industry pointed out that this by-catch was really being taken as a directed by-catch.

- It was ***recommended*** that the percentage of by-catch be reviewed whenever changes occur in the TAC levels for other directed species.

The large, relatively unregulated monkfish landings by the scallop fleet was also discussed. Industry indicated that they have concerns that this fleet is directing for this species in traditional monkfish grounds and not catching them purely as by-catch even though they record them as caught in traditional scallop grounds.

- It was ***recommended*** that documentation to verify size composition and true set locations of monkfish from this fishery, should be sought.

A discussion of the increasing catch trend since 1990, pointed out that this was likely an indication of increased effort only and not an indication of increased abundance. Industry concurred.

Resource Status

Comparisons of length frequencies of commercial, survey and directed fisheries generated a discussion of the possibility of discarding in the by-catch fishery. This was not denied by industry participants.

The discussion then focused on survey length frequencies and whether these data could be amenable to the calculation of total mortalities.

- It was ***recommended*** that the possibility of estimating Zs from the survey be investigated for the next monkfish review.

It was noted that mean weight and mean numbers per tow have been increasing since the 1990s and that evidence of recruitment was apparent, particularly in 4X.

Outlook

It was agreed that the review of monkfish should include 5Zc given the transboundary nature of this species. However, it was noted that management of this resource should be independent of the US considering the lack of understanding of the migratory nature and reproductive biology of monkfish.

Concern was expressed about the potential for over exploitation of monkfish and that any modification in the quotas of other groundfish resources should warrant a review of current by-catch levels.

It was noted that monkfish catches by scallop dredges are largely unregulated and it was generally felt that this situation should be addressed by management.

Harbour Porpoise

Ed Trippel presented his working paper. The two issues addressed were (1) the estimate of by-catch of Harbour porpoise in 1995 by the Canadian gillnet fishery in the Gulf of Maine area, and (2) the effectiveness of pingers in reducing by-catch. A number of clarifications were requested on methods and the analysis. These were addressed and the results accepted. No research recommendations were made.

Grey Seals and Sable Island

Sable Island Grey Seal Pup Production Estimates

The results of the 1989 and 1990 study to calibrate aerial survey estimates against ground-based counts of pup production, and the 1993 estimate of pup production were presented. Factors considered in the analysis included corrections to the tagging studies counts to account for pups missed during tagging (less than 2%) and untagged dead pups missed (less than 2.5% of all dead; i.e. since the number of dead pups represented less than 2% of total pups produced, the number of dead missed represents less than 0.05% of total pup production). Thus an upward adjustment of 2.05% would correct for all pups missed during the tagging work.

A complete count of all pups born in the main pupping area in 1990 on January 20th, represented over 94% of the total production in that area derived from the tagging work and combined with a second count on January 28th for pups born after the 20th represented over 99% of the total production. These results suggest that most grey seal pups do not emigrate from Sable before the end of January.

The results of the aerial surveys were corrected for reader error and new pups born after the surveys were added using a model which estimated percent of pupping complete

from the rate of maturation of the pups. Comparison of the reader's counts with ground-truthing surveys suggest that the detection rate was between 0.84 and 0.996. The proportion of pups born when the aerial surveys were conducted was estimated as between 0.88 and 0.96. The corrected aerial survey estimate in 1990 differed by less than 1% from the corrected tagging study estimate; the 1989 aerial survey estimate was 12% higher than the tagging study estimate. The greater discrepancy may have been due to the use of black-and-white file in 1989, which resulted in a lower detection rate by the reader.

- It was *recommended* to Review the model used to estimate the proportion of pups born by the date of the aerial survey. The model did not appear to fit the observed data in the early maturation stages well. It was felt that some analysis should be conducted to investigate which would be the most appropriate distribution (e.g. beta, delta, etc.) to model pelage maturation.

- It was *recommended* that the following suggestions be done regarding future surveys:
  i. an increase in the number of ground-truthing areas since those data are crucial for estimating the detection rate; that correction factor will account for pups undetected by the reader as well as dead pups which may lower detection rate than live ones;
  ii. surveys for pelage stages should not follow a specific group of pups, rather random transects should be used on each successive survey date to ensure the overall cohort maturation rate was being followed, not a subset of pups;
  iii. estimating the maturation ogive will be necessary for each year that the aerial survey is conducted and since the pelage surveys are crucial to estimating proportion of pups born, more transects with increased frequency would improve the model fitting; and
  iv. since the first birth date is critical for all these models in estimating the proportion of pups born before the date of the aerial survey, some attempt should be made to establish when the first birth occurs on Sable.

Projections for Variable Time Periods

Industry is interested in knowing whether the fishing season needs to coincide with the calendar year. Stratis Gavaris presented a projection module for ADAPT for Windows that has been designed to accommodate variable time periods of any duration less than 2 years. There were questions on the methodology which were clarified. It was indicated that for longer projections it is important to have stability in the pattern of weights-at-age and of partial recruitment. This was not, however, thought to be a problem for a period less than 2 years. There were no research recommendations.

Concluding Remarks

Mike Sinclair thanked the participants for their contribution to the peer review process. He noted that the participation in the meeting by representatives of the fishing industry and by scientists from outside of the Maritimes Region has been very helpful.

Appendix 1.

Agenda
Gulf of Maine Area RAP Subcommittee Meeting
10 - 13 September 1996
Hayes Boardroom, Fish Lab, BIO

	9 September Monday	10 September Tuesday	11 September Wednesday	12 September Thursday	13 September Friday
0830-0900		Introduction	White Hake	Monkfish	Review SSRs
0900-0930		Environment	White Hake	Monkfish	Review SSRs
0930-1000		Environment	White Hake	Monkfish	Review SSRs
1000-1030		Coffee	Coffee	Coffee	Coffee
1030-1100		4X Cod	White Hake	Harbour Porpoise	Review SSRs
1100-1130		4X Cod	White Hake	Harbour Porpoise	Review SSRs
1130-1200		4X Cod	White Hake	Harbour Porpoise	Review SSRs
1200-1300	Travel	Lunch	Lunch	Lunch	Lunch
1300-1330		4X Cod	4VsW Skate	Harbour Porpoise	Review SSRs
1330-1400		4X Cod	4VsW Skate	Harbour Porpoise	Review SSRs
1400-1430		Pollock	4VsW Skate	Grey Seal	Review SSRs
1430-1500		Pollock	4VsW Skate	Grey Seal	Review SSRs
1500-1530		Coffee	Coffee	Coffee	
1530-1600		Pollock	4VsW Skate	Grey Seal	Travel
1600-1630		Pollock	Monkfish	Grey Seal	
1630-1700		Pollock	Monkfish	Grey Seal	

Appendix 2. List of participants.

Name	Affiliation	Phone	Fax	E-Mail
Mike Sinclair	MFD/BIO	(902) 426-4890	(902) 426-1506	m_sinclair@bionet.bio.dfo.ca
Jerry Black	MFD/BIO	(902) 426-2950	(902) 426-1852	jerry.black@scotia.dfo.ca
Wayne Stobo	MFD/BIO	(902) 426-3316	(902) 426-1506	w_stobo@bionet.bio.ns.ca
Fred Page	MFD/SABS	(506) 529-8854	(902) 529-4274	f_page@bionet.bio.dfo.ca
Bob O'Boyle	MFD/BIO	(902) 426-4890	(902) 426-1506	r_oboyle@bionet.bio.dfo.ca
Ken Frank	MFD/BIO	(902) 426-3498	(902) 426-1506	k_frank@bionet.bio.dfo.ca
John Decker	SWFGA	(902) 656-2019	(902) 656-2006	
Sam Elsworth	FRCC/HWCFA	(902) 868-2140	(902) 868-2596	battfish@fox.nstn.ca
Jim Fraelic	SSGFA	(902) 354-5682	(902) 354-5682	
Peter VanBuskirk	SCGGA	(902) 875-2213	(902) 875-1079	
Evan Walters	SF.FA	(902) 637-3276	(902) 637-3270	
Claude d'Entremont	Inshore Fisheries Ltd.	(902) 762-2522	(902) 762-3464	inshore@atcon.com
John Neilson	MFD/SABS	(506) 529-8854	(506) 529-5862	neilson@sta.dfo.ca
Jon Hansen	DFO/Halifax	(902) 426-9046		
Brian Giroux	SFMGFA	(902) 742-6732	(902) 742-6732	sfmobile@fox.nstn.ca
Ram Myers	DFO/NFLD	(902) 772-5431	(902) 772-2067	
Don Bowen	MFD/BIO	(902) 426-8909	(902) 426-1506	d_bowen@bionet.bio.ns.ca
Stratis Gavaris	MFD/SABS	(506) 529-8854	(506) 529-5862	sgavaris@sta.dfo.ca
Paul Fanning	MFD/BIO	(902) 426-3190	(902) 426-1506	pfanning@bionet.bio.ns.ca
Maureen Yeadon	FRCC	(902) 852-3005	(902) 852-3005	
Richard McGormand	NS Fisheries	(902) 424-4560	(902) 424-4671	
Terry Decker	MFD/Lunenburg	(902) 634-4346	(902) 634-4346	t_decker@bionet.bio.dfo.ca
Kevin Potter	Auditor General	(902) 426-9371		
Glenn Doucette	Auditor General	(902) 426-6514		
Greg Peacock	Res. Management	(902) 426-3675	(902) 426-9683	
Ralph Halliday	MFD/BIO	(902) 426-3240	(902) 426-1506	r_halliday@bionet.bio.dfo.ca
Donald Clark	MFD/SABS	(506) 529-8854	(506) 529-5862	clark@sta.dfo.ca
Gloria Poirier	MFD/GFC	(506) 851-2035		poirierg@gfc.dfo.ca
Daryl Lyon	MFD/Lockport	(902) 656-3279	(902) 656-3279	
Frank	Pubnico, FRCC	(902) 761-3006	(902) 762-2965	
Jim Simon	MFD/BIO	(902) 426-4135	(902) 426-1506	j_simon@bionet.bio.dfo.ca
Mark Fowler	MFD/BIO	(902) 426-3529	(902) 426-1506	m_fowler@bionet.bio.dfo.ca
Ross Claytor	MFD/GFC	(506) 851-6249	(506) 851-2387	claytorr@gfc.dfo.ca
Richard Apostle				
Gordon Greencorn	NS Fisheries	(902) 885-3096	(902) 885-3095	
Peter Hurley	MFD/BIO	(902) 426-3520	(902) 426-1506	p_hurley@bionet.bio.dfo.ca

Appendix 3. List of documents distributed.

Page, F., and R. Losier. Overview of near-bottom water temperature and salinity conditions observed during the Canadian summer research vessel surveys conducted within NAFO areas 4VWX from 1970-96.

Clark, D. Assessment cod in Division 4X in 1996.

Neilson, J.D., and P. Perley. The 1995 assessment of pollock (*Pollachius virens*) in NAFO divisions 4VWX and subdivision 5Zc.

Fowler, M., J. Black, R. Mohn, and M. Sinclair. The 4VWX and 5Zc white hake assessment for 1996.

Simon, J.E., and K.T. Frank. A skate wingding: Assessment of the Division 4VsW skate fishery.

Beanlands, D., and C. Annand. Status of monkfish on the Scotian Shelf and Northeast Georges Bank.

Trippel, E.A., M.B. Strong, J.D. Conway, C. Hood, C. Richter, and J. Lien. By-catch of Harbour porpoise (*Phocoena phocoena*) in the lower Bay of Fundy gillnet fishery in 1995.

Stobo, W.T., and R.A. Myers. Estimates of grey seal pup production on Sable Island in 1989, 1990, and 1993.

Gavaris, S. Projections for variable time periods.

Appendix 4.

Working Group Proceedings on Monkfish
21 August & 4 September 1996
Hayes Boardroom, BIO

The flatfish, s. hake, redfish and monkfish RAP working group met twice to discuss 4VWX5Zc Monkfish prior to the fall RAP. Participants at the 21 August meeting were C. Annand, D. Beanlands, P. Fanning, R. Halliday, R. Mohn and W. Stobo (chair) and at the 4 September meeting, C. Annand, D. Beanlands, R. Branton, Allister D'Entremont (fisherman), Evan D'Entremont (fisherman), R. Halliday, T. McClean (contractor), R. Mohn and W. Stobo (chair)

W. Stobo opened the first meeting by welcoming everyone and stating that the only agenda item was the consideration of the monkfish information that had been compiled by Diane Beanlands. It was noted that these meetings were to assist Diane in preparing the assessment working paper and draft Stock Status Report (SSR), either through direct analytical contribution or through commentary made at these meetings. It was not to peer review the documents per se. This is to happen at the Subcommittee meting to be held 10 - 13 September at BIO. The second meeting, with fisherman participation, provided the opportunity to review the revised analyses and SSR.

August Meeting:
It quickly became evident that a significant component of the monkfish biomass in the northwest Atlantic occurred in the Gulf of Maine area, and that a substantial amount of the Canadian fishery was prosecuted on the northeast edge of Georges Bank.

- recommended that the analysis be redone incorporating the information from the Canadian portion of Georges Bank, along with reference to the state of the monkfish resource in the Gulf of Maine from US research surveys and resource analyses
- recommended that the Canadian summer 4VWX and the 5Z spring RV surveys be used in the analysis of Canadian data.

A number of points were noted: 1) that traditionally monkfish landings have been almost exclusively by-catch of the groundfish fishery with levels of up to 20% on the Scotian Shelf and 10% on Georges Bank. 2) The value of CPUE trends was questioned since they were derived from the data base as "main species" on a sub-trip basis and thus it is difficult to relate directed effort to the effect of largest amount of fish caught during part of the trip (ie. large incidental catches of monkfish). 3) On Georges a major portion of the catch was taken in scallop dredges as a by-catch of the scallop fishery. 4) Relatively few length frequencies were available from the commercial fishery, and none from the scallop fishery.

Related to the Industry survey, it was indicated that a directed fishery of 200t had been established for this venture. The survey design was based on the geographical area in 4X being divided into blocks and the fishermen being directed to fish within those blocks, but the set locations were to be at their discretion.

- recommended that mention should be made in the SSR of this joint venture in the 'Fishery' section
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- recommended that a section on the current results of this joint venture be further elaborated in the Res Doc.

Related to the 'Outlook' portion of the SSR, it was suggested that comment be made to indicate 1) that the US stock and fishery situation could have a potential impact on the Canadian fishery; but since there was no evidence that monkfish undergo major migratory movements, and there was evidence of discrete spawning in the Canadian zone, the resource which the Canadian fishery exploits may be relatively independent; 2) there is insufficient information to determine the abundance of this resource at this time; 3) there is new recruitment occurring beyond that observed over many years; 4) there has been a relative disappearance of commercial sized fish, but it is unknown if due to natural of fishery causes; 5) future management, especially in the Georges Bank area will have to take into consideration the quantity of monkfish being taken in scallop dredges; and 6) although new recruitment is occurring, if traditional fisheries re-develop, there will be an accompanied increase in the level of monkfish by-catch which could reduce the potential for a sustained directed monkfish fishery.

September Meeting:
At this meeting the draft Res. Doc. and draft SSR were reviewed. The recommendations raised at the previous meeting, pertaining to the analysis, were addressed in the documents presented. Additional recommendations for presentation were made.
- recommended that the 1996 catch data only be included in the quarterly breakdown and only for the first and second quarters because the fishery was still being prosecuted and catch statistics for the last two quarters were incomplete
- recommended that figures be included showing the RV distributions relative to temperature to evaluate the possibility that small fish are associated with warm water

Extensive discussion ensued on the fishery, utilizing the expertise of the fishing industry participants. It was noted that the directed monkfish fishery has a very low by-catch of other fish; this is probably due to the localized distribution of monkfish and the fishing gear used (square mesh and large openings -208mm). Concern was expressed that the catches in scallop dredges occurred throughout 4VWX and 5Zc and were largely unregulated. It was also noted that this portion of the fishery utilized only the tail portion of the fish while the rest of the fishery used a greater proportion of the total fish.

The joint biological research, funded by the industry, was also discussed. The various objectives of study relate to improving our knowledge of age, growth and reproductive parameters of this species and improving the derivation of conversion factors used in converting fish processed at sea to the whole, or round, state.

Recommendations from the discussions that relate to future research were:

- **recommended that the length frequencies from the RV and commercial surveys be compared, taking care that only the strata covered in both surveys are used in the analysis**

- recommended that the data set for the industry survey be edited to ensure that only those sets designated as survey stations prior to the start of the survey be used in analyses relating to abundance trends; ie. do not include additional sets made for other reasons, since that could bias the results.
- recommended that a request for length frequencies from scallop dredges be made to G. Roberge
- recommended that the possibility that smaller monkfish were being cut for the tail market at sea and thus not available for length frequency measurement be addressed since the derivation of selection curves could be affected by such procedures
- recommended that conversion factors used to convert tail weights to total weight be reviewed
- recommended that the biological initiatives of the joint study be continued
- recommended that the industry surveys conducted during the remainder of the joint study use the same mesh size as that in 1996

Flatfish, Redfish, Silver hake, Monkfish Working Group Minutes

Redfish Review

The working group met on 18 and 26 September to discuss data and analyses which will be available for consideration on Redfish in preparation for the Zonal meeting. R. Branton, R. Halliday, M. Showell and W. Stobo participated in both meetings; R. O'Boyle also participated in the first meeting.

At the 24 September meeting, a number of suggestions were made related to analysis and data inclusion for the Zonal review

i) include 1996 catch information only inclusive of July since those catch statistics will not change much in the final year end reports

ii) include a map showing the geographical distribution of the 1996 fishery

iii) management made a number of fishery closures and variation orders in 1996 without any consultation with Science; thus we were unable to discern if there was any biological basis for these actions; the group thought it would be worthwhile to clarify the rationale for the fishery closures in 1995 and 1996 and discuss the implications related to the seasonality of the 1995 fishery

iv) there were discrepancies between the hailed catches by vessel category versus the landing statistics; it was suggested that some effort be placed on sorting out the reasons for these differences

v) since the number of LF samples were limited in some areas of the fishery, it was suggested that the feasibility of pooling samples over areas larger than unit areas be examined in order to improve seasonal coverage and/ or the number of samples available for weighting catch

vi) the value of the catch rate and effort data as an indication of resource status was questioned mainly because of the confounding effects of management actions in closing access to geographical areas; it was agreed that these data be included in the document, BUT only as a description of the fishery, NOT as an indication of resource status

vii) small fish appear concentrated in some areas; it was suggested that by using ANOVA the effects of area, year and mesh size could be addressed; a similar consideration could be given to catch; and in the length consideration, the NSP data should be included to evaluate if significant differences occur due to data source

viii) small fish appear to be most abundant in area 4Xo; it was suggested that the proportion of small fish in 4Xo versus the whole 'unit 3' area be examined to determine how important 4Xo is for smaller redfish

ix) the biological study on faciatus vs mentella was discussed and it was agreed that the current results were not conclusive for the 'unit 3' area. It was felt that the study should continue with further analysis of the effects of spatial variation and depth of sample collection

At the meeting of the 26th, additional analyses were presented. Many dealt with the suggestions from the meeting of the 18th, while others were the result of meetings Bob Brantonb held with Industry participants in Pubnico and Liverpool during the invtervening week. discussion points and comments included:

i) it was noted that many of the large vessel ITQs were being sub-contracted to smaller boats using the Temporaty Vessel Replacement Provision (TVRP), and some of these sub-contracted boats were new entrants to the fishery. This practise explains the apparent over-run of quota by the small boat fleet and also further confounds catch rates (see (vi) above) because new, and inexperienced, entrants to the fishery would probably further depress catch rates. Some industry participants had expressed concern about a shifting of the balance in catches between inshore (ie. small) boats and offshore (ie. large) boats.

ii) in the existing analyses, land based length frequencies have been combined with Observer samples; some concern was expressed that since Observers were deployed during the last half of 1994 and 1995 preferentially to cover areas where small fish represented larger proportions of the catch, extrapolation to a whole fishery length frequency may be confounded. It was agreed that for 1996 the data presentation follow that used in 1995 (ie. combining the 1994 NSP and OP length frequency samples without adjustment, exclude the 1995 test fishery samples (4Xo) and weigh the 4Xo catch in the last half of 1995 by length frequency samples from contiguous fishing areas.

- **it was agreed that this potential problem be examined in greater detail for the 1997 RAP**

iii) it was noted that the bycatch of other species in the redfish fishery is below 10% in most areas; in 4Xp and 4Xq the bycatch is considerably higher. If the bycatch is small fish which are discarded, there is a potential resource problem issue, but if the bycatch is of large fish, and they are counted against the vessels' ITQ for those species, then there is no resource issue; but there may remain an operational problem in terms of ' Conditions of Licence'.

iv) the statistical analysis of the small fish (see (vii) above) prevalence in the catch was not completed for this meeting. It was agreed that it would not be presented to the Zonal meeting until it could be reviewed by the working group

- **it was agreed that the statistical analysis be completed for the 1997 RAP**
- **it was also agreed that the US RV surveys and the Canadian spring RV surveys for the northeast portion of Georges Bank be reviewed and presented at the 1997 RAP**

Working Group Proceedings on Monkfish
21 August & 4 September 1996
Hayes Boardroom, BIO

The flatfish, s. hake, redfish and monkfish RAP working group met twice to discuss 4VWX5Zc Monkfish prior to the fall RAP. Participants at the 21 August meeting were C. Annand, D. Beanlands, P. Fanning, R. Halliday, R. Mohn and W. Stobo (chair) and at the 4 September meeting, C. Annand, D. Beanlands, R. Branton, Allister D'Entremont (fisherman), Evan D'Entremont (fisherman), R. Halliday, T. McClean (contractor), R. Mohn and W. Stobo (chair)

W. Stobo opened the first meeting by welcoming everyone and stating that the only agenda item was the consideration of the monkfish information that had been compiled by Diane Beanlands. It was noted that these meetings were to assist Diane in preparing the assessment working paper and draft Stock Status Report (SSR), either through direct analytical contribution or through commentary made at these meetings. It was not to peer review the documents per se. This is to happen at the Subcommittee meting to be held 10 - 13 September at BIO. The second meeting, with fisherman participation, provided the opportunity to review the revised analyses and SSR.

August Meeting:
It quickly became evident that a significant component of the monkfish biomass in the northwest Atlantic occurred in the Gulf of Maine area, and that a substantial amount of the Canadian fishery was prosecuted on the northeast edge of Georges Bank.

- recommended that the analysis be redone incorporating the information from the Canadian portion of Georges Bank, along with reference to the state of the monkfish resource in the Gulf of Maine from US research surveys and resource analyses
- recommended that the Canadian summer 4VWX and the 5Z spring RV surveys be used in the analysis of Canadian data.

A number of points were noted: 1) that traditionally monkfish landings have been almost exclusively by-catch of the groundfish fishery with levels of up to 20% on the Scotian Shelf and 10% on Georges Bank. 2) The value of CPUE trends was questioned since they were derived from the data base as "main species" on a sub-trip basis and thus it is difficult to relate directed effort to the effect of largest amount of fish caught during part of the trip (ie. large incidental catches of monkfish). 3) On Georges a major portion of the catch was taken in scallop dredges as a by-catch of the scallop fishery. 4) Relatively few length frequencies were available from the commercial fishery, and none from the scallop fishery.

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